What is Claimed is:

1. An imaging system comprising:

an array of lenses;

a plurality of sensors for each lens, each sensor having a single detection element of size $p_x p_y$, with the center-to-center spacing of the detection elements being d_x in the x-direction and d_y in the y-direction, the plurality of sensors being adjacent to an image plane of a corresponding lens; and

a plurality of macro-pixels of size $d_x d_y$, each macro-pixel corresponding to a sensor and being between the corresponding lens and the sensor, each macro-pixel having $m_x m_y$ micro-pixels, each micro-pixel being of size $d_x/ m_x \cdot d_y /m_y$ and having one of a high and a low transmittance function,

wherein light transmitted through each lens and directed towards a sensor will impinge on the sensor after multiplication by the transmittance of the macro-pixel, and

wherein the imaging system has a resolution in the image plane of greater than $1/p_x$ in the x-direction or $1/p_y$ in the y-direction.

2. The imaging system as recited in claim 1, wherein a ratio of a size of each macro-pixel to a size of each micro-pixel is proportional to a number of lenses in the array of lenses.

3. The imaging system as recited in claim 1, wherein the size $d_x/ m_x \cdot d_y /m_y$ is on the order of a desired resolution of the imaging system.

4. The imaging system as recited in claim 1, wherein all m micro-pixels for a corresponding macro-pixel have high transmittance.

5. The imaging system as recited in claim 1, wherein only one micro-pixel for a corresponding macro-pixel has high transmittance.

6. The imaging system as recited in claim 1, wherein a number of lenses in the x-direction is different from the number of lenses in the y-direction.

7. The imaging system as recited in claim 1, wherein the high transmittance is one and the low transmittance is zero.

8. The imaging system as recited in claim 1, wherein the high transmittance is greater than 0.5 and the low transmittance is less than 0.5.

9. The imaging system as recited in claim 1, wherein a majority of the macro-pixels have at least 20% high transmittance micro-pixels .

10. The imaging system as recited in claim 1, wherein the lens is formed on one side of a substrate and the filter is formed on an opposite side of the substrate.

11. The imaging system as recited in claim 1, wherein the filter is formed on the lens.

12. The imaging system as recited in claim 1, wherein at least part of a path between the lens and the array of macro-pixels has a refractive index greater than one.

13. The imaging system as recited in claim 10, wherein a majority of the path has a refractive index greater than one.

14. The imaging system as recited in claim 1, wherein one filtering element allows all the light incident thereon to impinge on the macro-pixel.

15. The imaging system as recited in claim 1, further comprising different color filters in paths of corresponding macro-pixels.

16. The imaging system as recited in claim 1, wherein the lens includes a substrate having parallel surfaces, an optical element being formed on at least one of the parallel surfaces.

17. The imaging system as recited in claim 1, wherein the lens includes at least two substrates having parallel surfaces, at least two optical elements, each optical element being formed on a different surface of the at least two of the parallel surfaces.

18. The imaging system as recited in claim 16, wherein one optical element of the least two optical elements is a diffractive optical element.

19. The imaging system as recited in claim 17, wherein the diffractive optical element corrects for aberration of the lens.

20. The imaging system as recited in claim 16, wherein the at least two substrates for an array of lenses are bonded together.

21. The imaging system as recited in claim 16, further comprising a spacer between the at least two substrates.

22. The imaging system as recited in claim 1, wherein $d_x d_y = p_x p_y$.

23. The imaging system as recited in claim 1, wherein each lens in array of lenses is a polygonal lens and corresponding macro-pixels and sensors fill in similarly sized area to that of the polygonal lens.

24. The imaging system as recited in claim 1, further comprising a processor receiving outputs from the plurality of sensors and combining outputs from corresponding sensors for different lenses.